

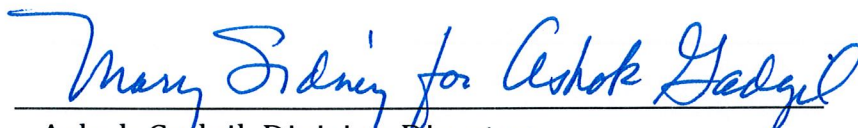
Environmental Energy Technologies Division

2013 Self-Assessment Project 2

A Self-Assessment of On the Job Training Practices

July 12, 2013

Approved by:


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7/15/13
Date


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7/12/13
Date

Introduction

An effective safety-training program can help reduce the frequency of injuries, property damage, production loss, and lost time from work. Safety training is also an important part of establishing a good safety culture within an organization.

All EETD personnel are currently required to complete some level of safety training. The types of training required depend on job role and the job-related hazards that have been identified through work authorization. The training courses offered are generally on-line or classroom-style format and are coordinated through the EHS Division training department. Many EETD lab areas contain specific hazards including hazardous chemicals, lasers, radiological sources, and high voltage electrical. Additional training specific to the equipment or procedures that involves these hazards is needed to ensure that affected personnel understand how to safely and effectively operate the equipment. This is generally accomplished through “hands-on” instruction that is also called “On the Job Training” (OJT). On the Job Training takes place in the work setting using the actual tools, equipment, and materials with “hands-on” instruction given by another person competent in the specific activity.

EETD currently maintains training materials that can be used as part of On the Job Training on an internal website accessible by all EETD personnel. These materials can be accessed by going to: <http://eetd-ehs.lbl.gov/content/job-training-ojt>

This self-assessment project was conducted to identify how On the Job Training (OJT) is being practiced within EETD lab areas, and if there are ways to improve effectiveness. A self-assessment team interviewed principal Investigators (PI's) from the Energy Storage and Distributed Resources (ESDR) department of EETD. The ESDR department performs battery and fuel cell research. Observations, noteworthy practices, and suggested improvements were compiled and are presented in this report.

Requirements

Lab training requirements are described in the following documents:

- LBNL PUB-3000, Health and Safety Manual, Chapter 24- Environmental Health and Safety Training
- LBNL PUB-3000, Health and Safety Manual, Chapter 6- Safe Work Authorizations
- LBNL PUB-3000, Chapter 32- Job Hazards Analysis
- LBNL EHS Training Website: <http://www.lbl.gov/ehs/training/>
- EETD Integrated Safety Management Plan- Section 10, “Qualification and Training”

All EETD personnel are required to complete a Job Hazards Analysis (JHA). The JHA process provides a documented mechanism to answer the question “how do I know that I’m doing my job safely?” It is a methodical analysis tool used to identify and control workplace hazards. Safety training requirements are identified through the JHA process. Formal Authorizations such as an

Activity Hazard Documents (AHD), Biological Use Authorizations (BUA), and Radiological Worker Authorizations (RWA) also trigger specific training requirements.

The work lead is responsible for ensuring the hazard information and training requirements in the Job Hazard Analysis, and formal work authorizations is accurate for all staff under their direction. This includes additional On the Job Training (OJT) to support any formal training requirements identified. On the Job Training takes place in the work setting using the actual tools, equipment, and materials with “hands-on” instruction given by another person competent in the specific activity. Once the trainee demonstrates an ability to perform the task properly, they are released by the work lead to work independently.

Methodology

The following methodology was used to conduct this On The Job Training self-assessment:

1. A self-assessment team was established to perform interviews of identified Principal Investigators and staff scientists.
2. A list of self-assessment questions pertaining to On the Job Training was developed by the self-assessment team and distributed prior to the interviews. (See Attachment 1)
3. A meeting of approximately 30-40 minutes was held with each Principal Investigator/Staff Scientist and responses to each self-assessment question were recorded.
4. A summary of the observations, noteworthy practices, and suggested improvements was compiled by the self-assessment team and presented in this report.

The following personnel participated on the self-assessment team:

- Ron Scholtz- EETD- Safety Manager
- Melissa Lunden- EETD- EAEI Dept. Staff Scientist
- James Basore- EHS- Training Manager

The following EETD Principal Investigators/Staff Scientists were interviewed:

- Nitash Balsara (Labs 70-123, 62-348)
- Vincent Battaglia (Labs 70-206, 70-218, 70-295, 70-299)
- Jordi Cabana (Labs 62-346, 62-337)
- Guoying Chen (Labs 62-312, 62-314, 62-320, 62-350)
- Robert Cheng (Lab 70-173)
- Marca Doeff (Labs 62-138, 62-150)
- John Kerr (Labs 62-218, 62-220, 62-246, 62-308, 62-310)
- Robert Kostecki (Labs 70-108, 70-174)
- Gao Liu (Labs 70-226, 70-269)
- Don Lucas (Lab 70-293)
- Venkat Srinivasan (Lab 70-263)
- Adam Weber (Lab 70-257)

The scope of this project applied to the following:

1. On the Job Training (OJT) practices.

2. ESDR department wet lab areas in Buildings 62 and 70.
3. Training of LBNL personnel including guests, affiliates, students, graduate students, post doctoral, and staff.

The following were not included in the scope of this project:

1. Standard on-line and classroom-style training courses already required through EHS Division.
2. Non-laboratory work areas such as office areas.
3. Lab areas belonging to the BTUS or EAEI departments of EETD.
4. Sub-contractors or other non-LBNL personnel.

Summary of Findings, Observations and Noteworthy Practices

The following is a summary of findings, observations, and noteworthy practices identified by the self-assessment team. Specific information from each interview is found in Attachment 2 of this report.

Findings:

1. No compliance or non-conformity issues were identified.

Observations:

1. All lab areas surveyed had some form of On the Job Training.
2. The OJT is focused primarily on newly hired personnel and is completed prior to being released to work in the lab area. There is no periodic or follow-up OJT unless there are issues observed by the work lead.
3. Completion of OJT is generally not documented unless an Activity Hazard Document covers the activity. This is considered "formal" OJT.
4. The amount of time spent on OJT can vary depending on the complexity of the activities the person will perform. Some OJT takes only a few minutes, while for more complex equipment it may take several days. In addition, the amount of time spent is also dependent on the level of experience the trainee already has. When the trainee has used similar equipment or processes at other organizations or lab areas they may not need as much OJT as another person who has little or no experience. This is determined through the PI or work lead's best judgment.
5. Most PI's hold regular staff meetings. Time is given to discussion of any safety issues, lessons learned or concerns. This can be considered a form of on-going OJT.
6. There is no common subject matter documentation used for OJT. For the most part, the OJT is given verbally based on the direct knowledge of the PI or work lead. In some more complex cases, an internal procedure or an applicable Activity Hazard Document documents the subject matter.
7. Due to common equipment and experimentation in ESDR lab areas, there is agreement on some OJT topics that would be useful if standardized and documented. These include:
 - a. Use and maintenance of glove boxes
 - b. Hazards of lithium and alkali earth metals
 - c. Chemical spill cleanup procedures

- d. Battery cell construction
 - e. Use of test equipment
8. Many PI's identified that OJT is also important for ensuring quality assurance of experimental results. This should be incorporated with safety when developing OJT materials.
 9. The preference for training format depends on the complexity of the topic. Formats that are visual and easy to follow are preferred (PowerPoint slides or video clips). Step by step prescriptive checklists are not as useful.
 10. There are no electronic or "soft copy" methods currently being used for documenting completion of OJT other than that required for activities covered by a Activity Hazard Document. There is a preference for an electronic tracking system rather than hard copy forms if documentation is desired.

Noteworthy Practices:

1. Use of an extensive checklist to document OJT for each person authorized to work in the lab area. Both the PI and authorized person sign the checklist after completion of OJT. A list of authorized persons is regularly updated and clearly posted on the lab door. (Cabana- Lab 62-346)
2. An extensive lab manual was developed as a reference document for new lab members to study before they receive the OJT, and is also used as a reference document for those delivering the OJT. Personnel can look up and follow simple step-by-step procedures on an on-going basis. (Kostecki- Lab 70-108 and 70-174)
3. Each piece of laboratory equipment is assigned a designated owner. Anyone who needs to use the equipment must receive OJT from the designated equipment owner. Once the OJT has been completed, the person is added to a list of approved equipment users. This list is posted in the lab area. (Kerr- Lab 62-220 and 62-246)
4. All lab area staff participates in the quarterly lab area walkthrough safety inspections. This gives the PI an opportunity to point out common safety issues and his expectations on correcting them. Staff members are then allowed to perform their own inspections and look for the issues discussed. This can be considered a form of on-going OJT. (Kerr- Lab 62-220 and 62-246)
5. A specific OJT checklist for complex equipment is used for training new personnel. This ensures that no important information is missed. (Doeff- Lab 62-138 and 62-150).
6. A library of "Safe Operating Procedures" has been developed for different types of experimental procedures and complex equipment. These are of a standard format and used as supporting OJT information and are available for reference when needed. (Balsara- Labs 70-123 and 62-348).
7. Short fuel cell assembly training videos are being developed and made available to personnel. (Weber- Lab 70-257)

Conclusions and Future Improvements

Conclusions

The following conclusions summarize the results of the EETD On the Job Training self-assessment project:

1. OJT is currently being practiced in all of the ESDR department lab areas.
2. The OJT methods used vary from each lab area and are determined by each Principal Investigator.
3. There are no common OJT program guidelines available for the ESDR department.
4. There is a need for developing OJT training materials for common equipment, experiments, and hazards in the ESDR department lab areas.
5. The Principal Investigators should continue to be given flexibility in identifying the best way of implementing OJT within their lab areas. However, OJT training materials and training tracking processes should be developed and made available to use as needed.

Recommendations and Suggested Future Improvements

The following recommendations and improvements should be made in order to enhance the On the Job Training program for EETD:

1. Almost all of the ESDR lab areas are covered under an Activity Hazard Document. During the next AHD annual review and update, the training section should be reviewed and updated to better describe all OJT methods employed. This would include a description of any additional OJT not required by the AHD. Any OJT training documentation can be uploaded directly into the Activity Hazard Document.
2. In the event that an Activity Hazard Document is not required for a lab area, or the PI determines to not use the AHD for documenting On the Job Training, a simple training plan should be developed. This will describe the “who, what, when” of the OJT program for the particular lab area. The EETD Safety Manager can develop a simple template and make available to the PI’s.
3. Training materials for common topics of interest need to be developed. The EETD Safety Manager will coordinate with the PI’s in developing training materials for glove box use, lithium metal hazards, chemical spill cleanup, and battery cell construction. These can be made available with previously developed OJT materials posted on the EETD safety website. A link to the EETD safety website OJT tab should also be added to the Activity Hazard Document training section.
4. All lab area staff meetings should continue to have a standing “safety discussion” agenda item as an on-going OJT opportunity. The EETD Safety Manager can further support these discussions by supplying brief Safety Alerts and visual training materials that the PI’s can use at their discretion.
5. Special-topic safety seminars (also called “brown bag” seminars) should be made available to EETD personnel as a means of on-going OJT. These could be topics of interest based on feedback from employees and the EETD Safety Committee. Two safety-related seminars have already been held and both were well received. The seminars can be building-specific and also include other divisions depending on the topic.

6. The recently developed EETD New Hire Orientation process should be fully implemented as an additional means of providing OJT to personnel new to the lab. This includes a walk-through of the work area and emergency procedures.
7. The results of this self-assessment will be made available to all PI's and Area Safety Leads so that they are aware of noteworthy practices and future plans. In addition, the results of this report will be made available to the EAEI and BTUS department PI's and line management.
8. A follow-up self-assessment should be performed in 2-3 years to determine if the OJT program has improved. Metrics should be developed to measure progress in implementation of OJT within EETD.

ATTACHMENT 1

On the Job Training Lines of Inquiry

1. Is On-the-Job Training (OJT) currently being offered to your lab personnel?
 - a. If so, who provides the On-The-Job Training?
 - b. Who receives On-The-Job Training, and how is that decided?
 - c. What does the training consist of and how is it performed?
2. When is the On-The-Job training provided?
3. How much time is typically spent giving On the Job Training to each person?
4. How is it determined that the person who received OJT successfully learned what was expected and who determines the competence?
5. Is any of the On the Job Training information that is provided documented?
6. Is completion of On the Job Training documented? If so, what is recorded?
7. Is any follow-up or periodic On the Job Training offered to lab personnel?
8. Are there any specific On the Job Training topics that would be most useful?
9. What would be the best way to maintain On the Job Training documentation for each specific lab area?

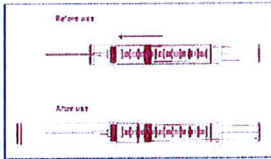
ATTACHMENT 2

Principal Investigator Feedback

| PI | Lab Areas | Assessment Date | Comments |
|-------------------|--------------------------------|-----------------|--|
| Gao Liu | 70-226, 70-269 | 6/27/13 | Post Docs give hands-on training. Level of training depends on experience. Glovebox chemistry is different from others. |
| Don Lucas | 70-293 | 6/12/13 | OJT is one-on-one training and is tailored to the individual's level of experience. |
| Venkat Srinivasan | 70-263 | 6/17/13 | OJT assigned to Post Doc. Training on glovebox, test equipment and cell construction. Need to address glovebox cleaning and maintenance. Discuss what is happening and what we need during weekly group meetings. |
| Adam Weber | 70-257 | 6/11/13 | OJT divided into two parts. General training for comm requirements when in a lab. Specific training on operation of equipment. Starting to produce short videos to demonstrate fuel cell assembly. |
| Guoying Chen | 62-312, 62-314, 62-320, 62-350 | 6/19/13 | OJT is equipment specific. Many guest users who need access to equipment. Staff meetings every two weeks started with safety discussion. |
| John Kerr | 62-218, 62-246, 62-308, 62-310 | 6/18/13 | Responsible person assigned to each piece of equipment who gives instruction on use. Entire group performs walkthrough inspections and are used as a training opportunity. Staff meetings include discussions of lessons learned in lab. Consider use of electronic lab books. |
| Jordi Cabana | 62-342, 62-361 | 6/10/13 | PI provides OJT. Use of extensive "new user check list" to document OJT training. Signed by both PI and user. Approved access list maintained based on check list completion. Different levels of access depending on authorizations. Follow-up information |

SHARPS SAFETY TIPS

- Use needles or syringes only when there is no other alternative.
- Needles must not be bent, sheared, broken, or removed from disposable syringes.
- Use syringes that re-sheath the needle or select a needleless system for the task whenever possible.
- Promptly dispose of sharps in a designated sharps disposal container.



5

One-Handed Scoop Method

- If re-sheathing or mechanical re-capping devices are not an option, use the "one-handed scoop method" for capping sharps.
- Place the cap on the bench top and "scoop" it up with the sharp, keeping your free hand out of the way.



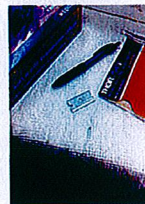
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Cut First Aid

- In the event you are cut:
 - Stop the bleeding- Use gentle pressure
 - Clean the wound- Rinse with clean water
 - Cover the wound- Bandage or gauze
- Seek medical attention immediately through Health Services in Building 26. Call **X6266**.
- Notify your supervisor of the injury.
- Health Services will initiate an Accident Report.
- Follow all recommendations given by the physician or nurse to prevent infection.



7

EXAMPLES OF WHAT NOT TO DO!

Straight Edge Blade
Not Properly Stored



Loose Glassware in
Drawer Can Break!



Poorly Stored Xacto
Knife. Blade Pointing
Out!



8

ATTACHMENT 4

Example On the Job Training Handout EETD Safety Alert

Environmental Energy Technologies Division

SAFETY ALERT

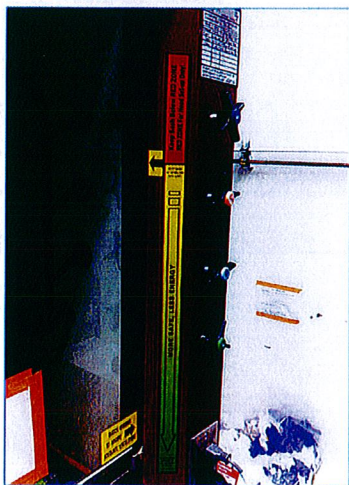
August 21, 2012

KEEP HOOD SASHES CLOSED WHEN NOT IN USE

Fume hoods represent the first line of worker safety measures in a research laboratory. Providing supply and exhaust air to fume hoods is highly energy intensive. A typical six-foot hood exhausting air at 100 linear feet per minute (fpm) and open 18 inches exhausts almost 1.5 million cubic feet of conditioned air every day. It takes a significant amount of energy to operate the exhaust fans needed for all this air. It also takes a lot of energy to cool or heat this air.

EETD lab workers can do their part to help significantly reduce energy costs and improve safety at the same time.

- Keep the hood sash **CLOSED** when you are not working in the hood.
- Close the hood sash before you go home each night.
- Keep the sash opening no higher than the limit arrows or sash stop while working in the hood.
- Follow good housekeeping practices inside the hood. Keep the front 6 inches clear and avoid clutter and obstructions in front of the exhaust slots and along the sides of the hood.



EETD has partnered with EH&S Division to apply color-coded reminder stickers to fume hoods in all EETD lab areas. We'll do periodic checks to determine the effectiveness of these stickers. In addition, building energy usage data will be tracked to determine energy savings as this awareness program continues. The results of this project will be made available to EETD personnel later this year.

